Commodore Single Disk Drive

Technical Manual

Model 1540/1541

commodore COMPUTER

P/N 990445

CONTENTS

Chapter One

1.1 Scope

In this chapter, a desciption is made of the proceedures necessary for servicing the Model 1540/1541 Floppy Disk Drive.

1.2 Unpacking

Special care should be exercised during unpacking not to damage the unit.

Unpacking proceedures are as follows:

a) Remove cardboard sleeve from styro-foam box

b) Open 'styro-foam' box and remove drive

c) Check the drives front door for proper operation

****
* *
* **Caution** *
* *
* **Do Not Use Magnetized Tools** *
* *
****

1.3 Protection against noise

A week signal from the media is detected in the head section of the drive. Hence, **do not** install the drive near a TV set or other areas where electromagnetic noise is generated. (i.e. motors, air-conditioners, etc)

1.7 Input/Output Cable

The length of the cable between the host and the drive (between the host and the last drive when the drives are daisy chained) should not exceed 5 meters (16 feet).

1.8 DC power source

The drive is powered by a internal power supply providing the drive with +12V and +5V.

1.9 Initial inspection

The drive can be briefly inspected for its operation by the following proceedure. Install the drive, connect the power and I/O cables. Turn drive on and make sure the front panel power lamp is on. Proceed to step 2.2.

1.10 Outline of functions

The 1540/1541 Minifloppy Disk Drive mechanism is composed of the data read/write head, track positioning mechanism, spindle drive mechanism and eject mechanism.

1.11 Read/Write Head

The Read/Write head uses a glass-bonded, ferrite/ceramic head. Track-to-track erasing is accomplished by the straddle erase method. The surface of the Read/Write head is mirror-ground to minimize weear of the head and media. Also, the head is desighned in such a way that the maximum signal can be obtained from the media surface.

1.12 Track positioning mechanism

Positioning of the Read/Write Head is accomplished by a stepping motor and steel belt. The stepping motor rotates clockwise or counter-clockwise by two steps per track. The control circuit on the logic board selects the direction and number of step to the desired track.

1.13 Spindle drive mechanism

The spindle drive motor operates on 12 VDC and turns the spindle, through a belt drive, at 300 revolutions per minute. The speed of the drive motor is controlled by a feedback signal from a tachometer which is housed in the drive motor assembly. The feedback signal controls a servo amp that supplies the 12 VDC drive current.

1.14 Eject mechanism

When the media is inserted in the Disk Drive and the door is closed the media is clamped by the spindle and hub. At this time the ejector mechanism is loaded by the insertion of the disk and locked. When the door is opened, the ejector mechanism is unlocked and the media pops out of the door.

Chapter Two

2.1 Mechanism Explanation

The 1540/1541 mechanism is installed in the system horizontally, however the drive will fuction if mounted vertically. The mechanical parts of the drive include an aluminum chassis, a stepping motor, head positioning assembly, drive motor, a hub and spindle assembly for centering and retaining the media during operation. The magnetic head is of a glass ceramic construction.

2.2 Function explanation

The drive is itself an independent memory device. The drive is composed of a media clamp rotating mechanism, ahead positioning mechanism and an eject mechanism. When the front door opens, the media can be inserted. All positioning operation excluding insertion and removal of the media are controlled by the internal guide mechanism. Closing the front door causes the media clamp mechanism to operate. Two operations are performed in the following order:

a) The media is centered.

b) The media is clamped and retained between the spindle and the hub.

The spindle and hub rotate at 300 r.p.m. through a closed-loop control circuit employing a D.C. motor/tachometer. It is important that the relationship between the head and the media is maintained correctly during operation. For this purpose, a pressure pad is used to hold and press down the media(about 12g) from the opposite side of the head, to maintain the correct contact with the head. This head assembly is coupled by a metal band to a four phase stepping motor the performs the track positioning. One step of the stepping motor corresponds to a 1/2 track movement. Use of a high-speed stepping motor and metal band drive, this series of disk drives can perform access operations at a very high speed.

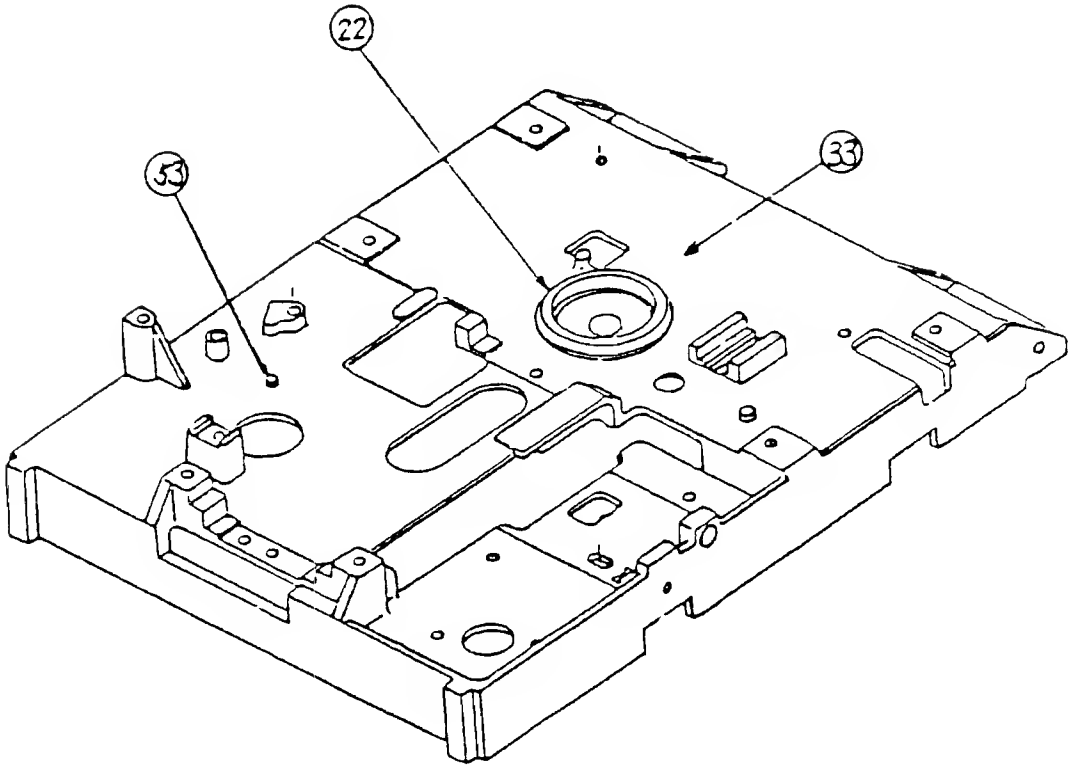
2.3 Assembly Proceedure

2.3.1 The housing assembly; install the eject pin and the spindle.

2.3.2 The housing assembly; on the reverse side install the spindle pulley.

2.3.3 FIG 1, The housing unit.

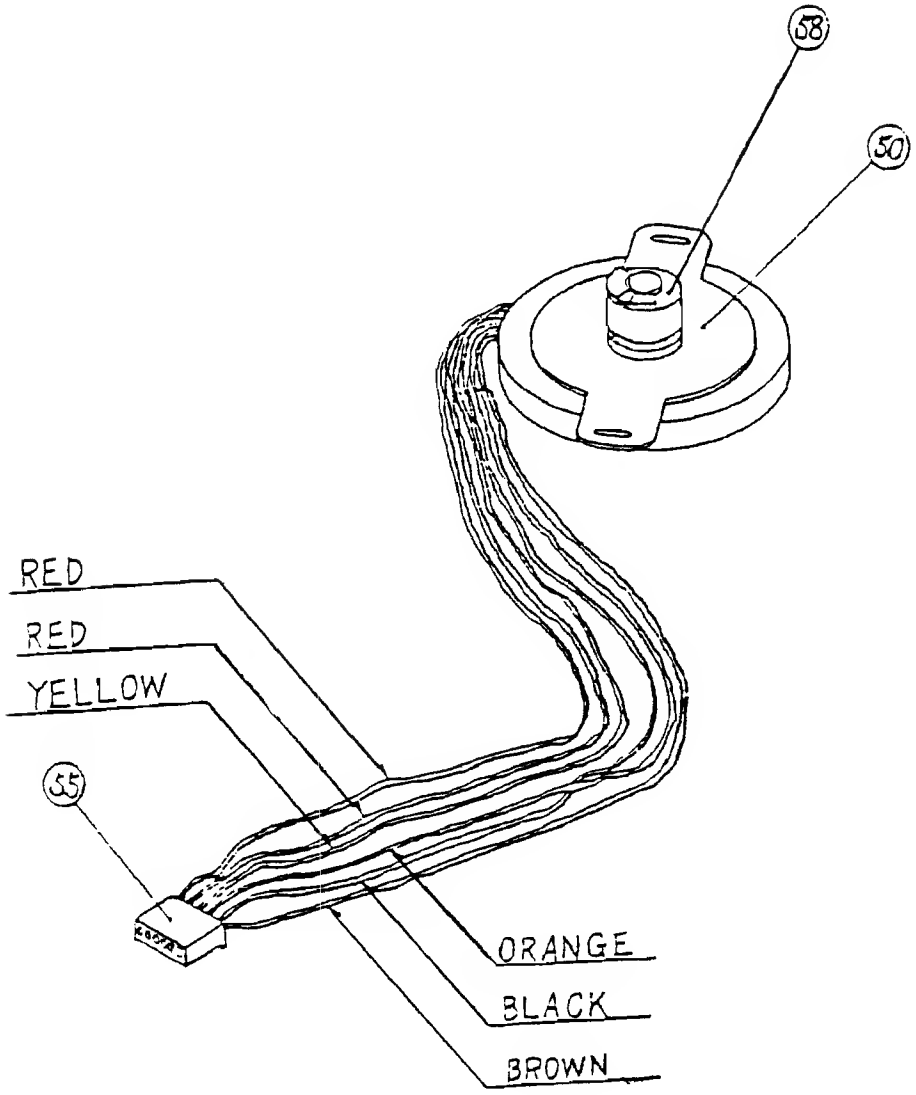
Part	Desciption
22	spindle
33	housing assembly.
53	eject pin



2.3.4 The stepping motor assembly; install the stepping pulley.

2.3.5 FIG 2, The stepping motor unit

Part	Description
50	stepping motor assembly
55	connector housing
58	stepper pulley



2.3.6 The D.C. motor assembly; install the motor pulley.

2.3.7 FIG 3, D.C. motor and control PCB

Part	Description
44	motor control PCB
48	D.C. motor
51	connector housing
59	D.C. motor pulley

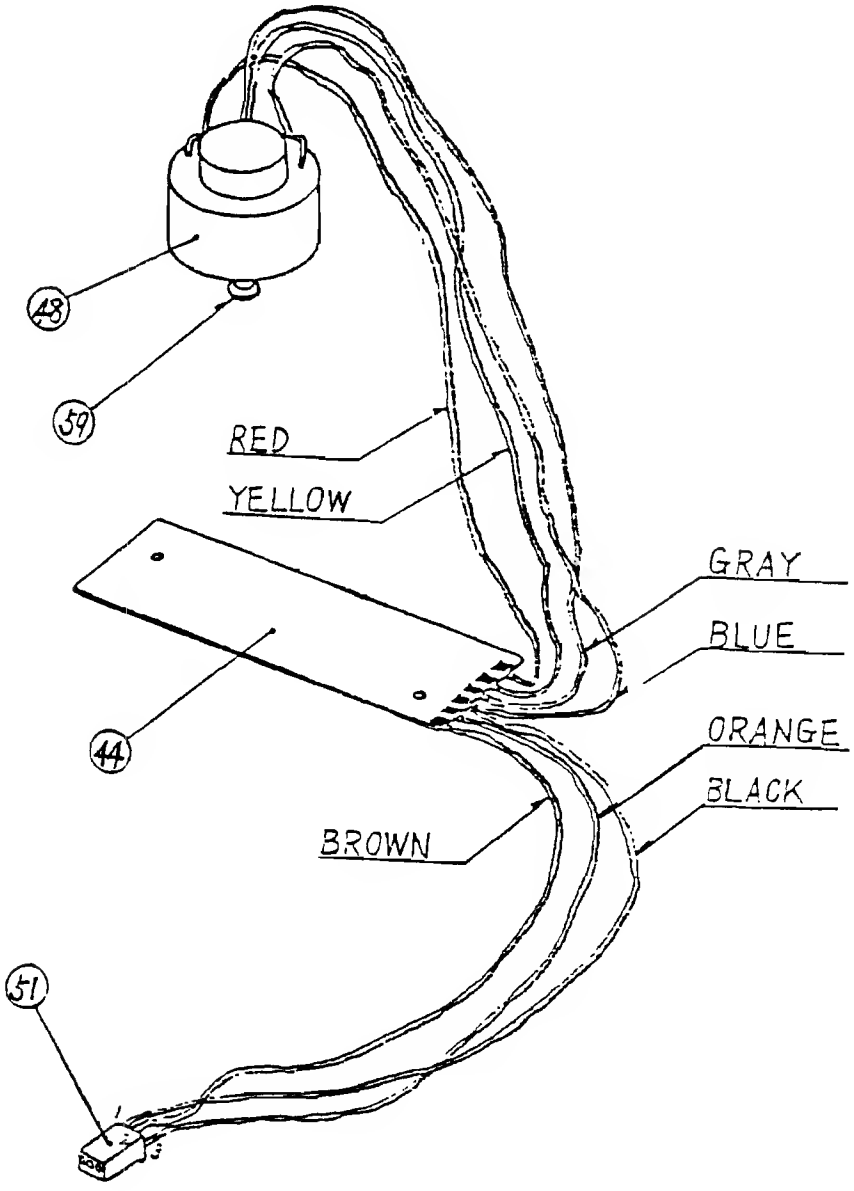


FIG. 6

Part	Description	Part	Description
20	binder screw	37	washer
21	diskette guide	38	eject spring
28	LED clamp	39	eject plate
29	front panel	40	slider
30	Flush screw	43	diskette guide
31	LED assembly	52	connector housing
32	LED holder ring		

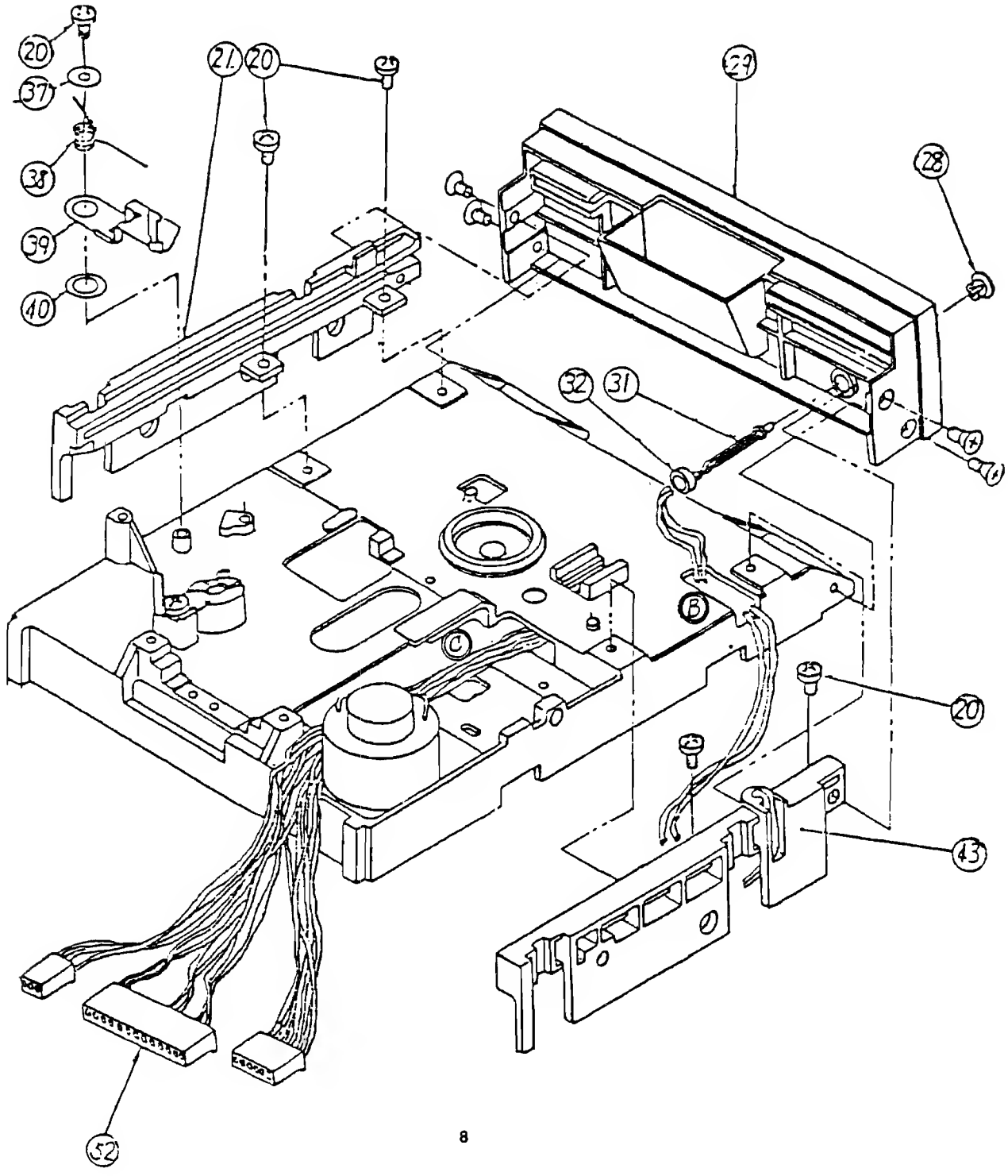


FIG 7.

Part	Description
15	binder screw
18	binder screw
24	tension pulley
25	guide shaft keeper
26	guide shaft
34	metal band
35	washer
36	head assembly
56	tension spring

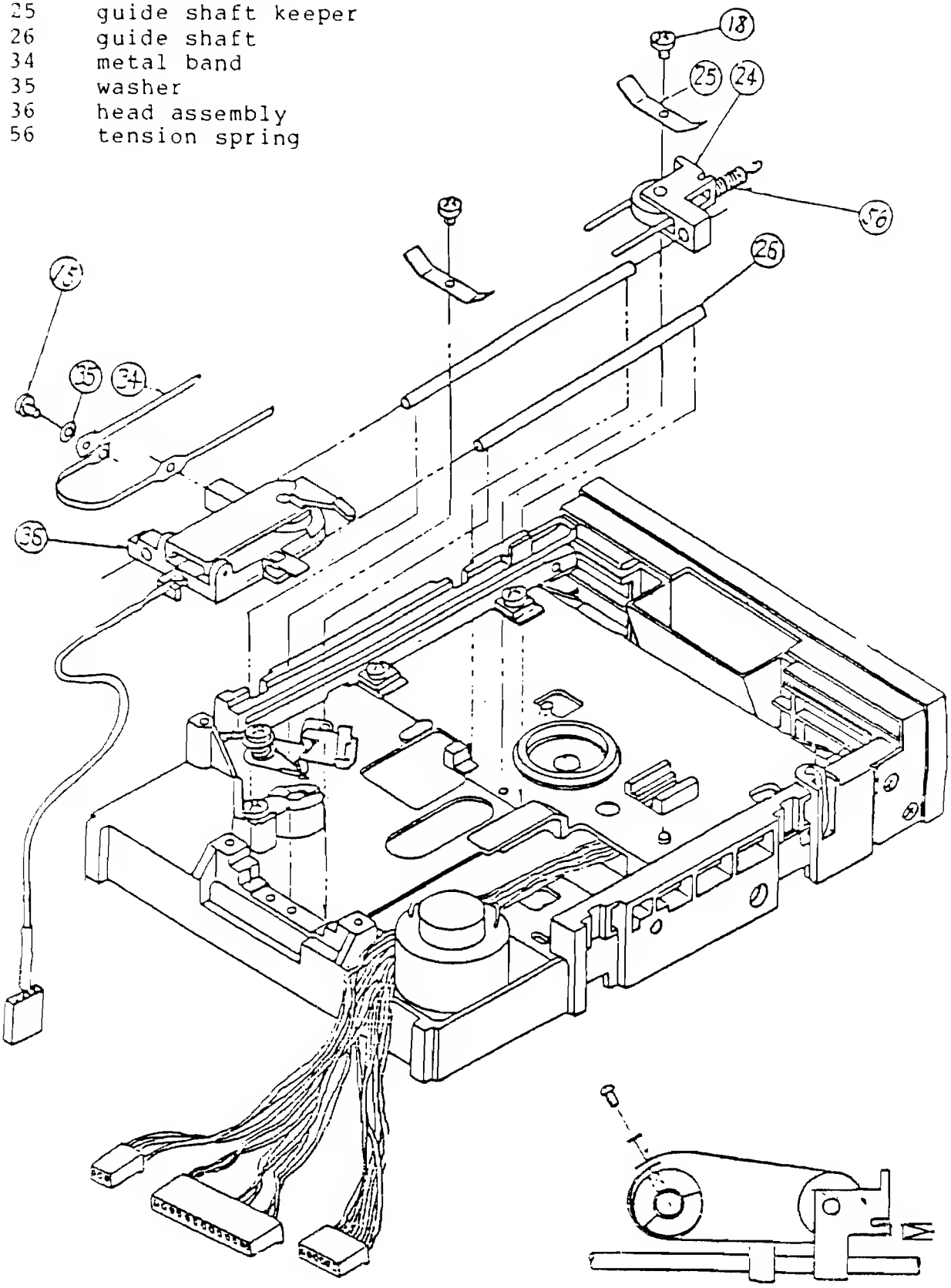


FIG 8

Part	Description
20	binder screw
45	cable clamp
49	cable ties

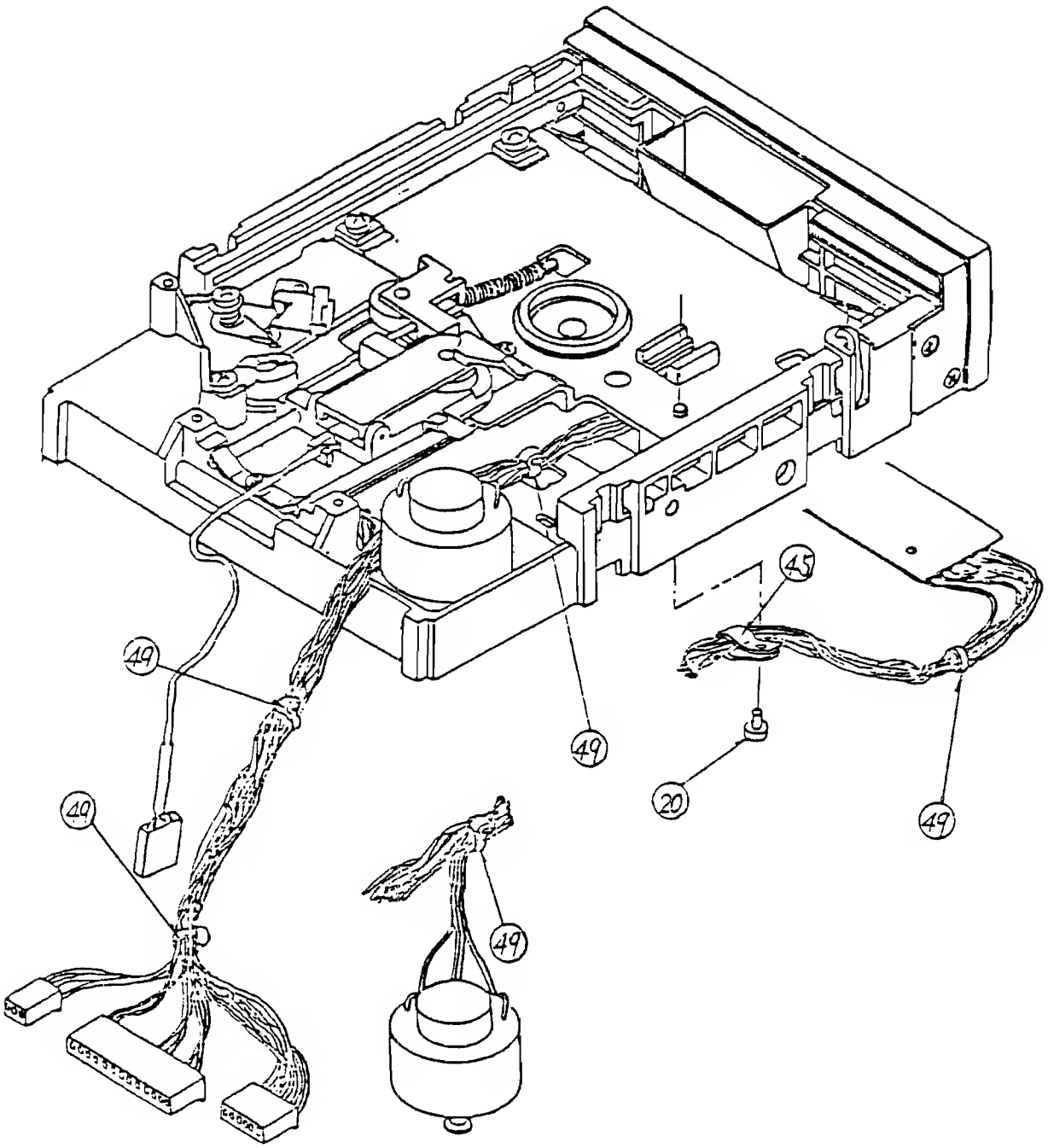
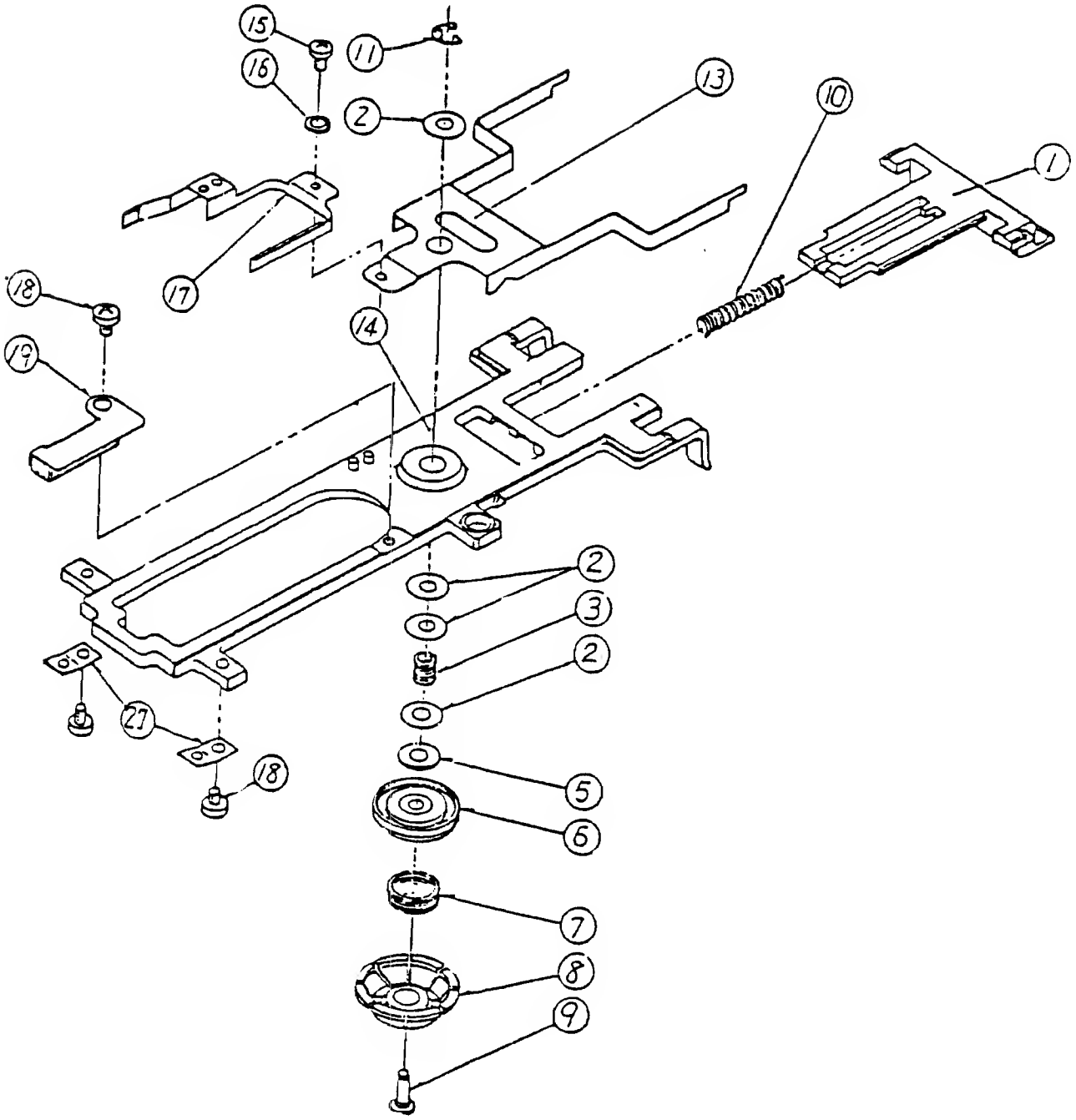


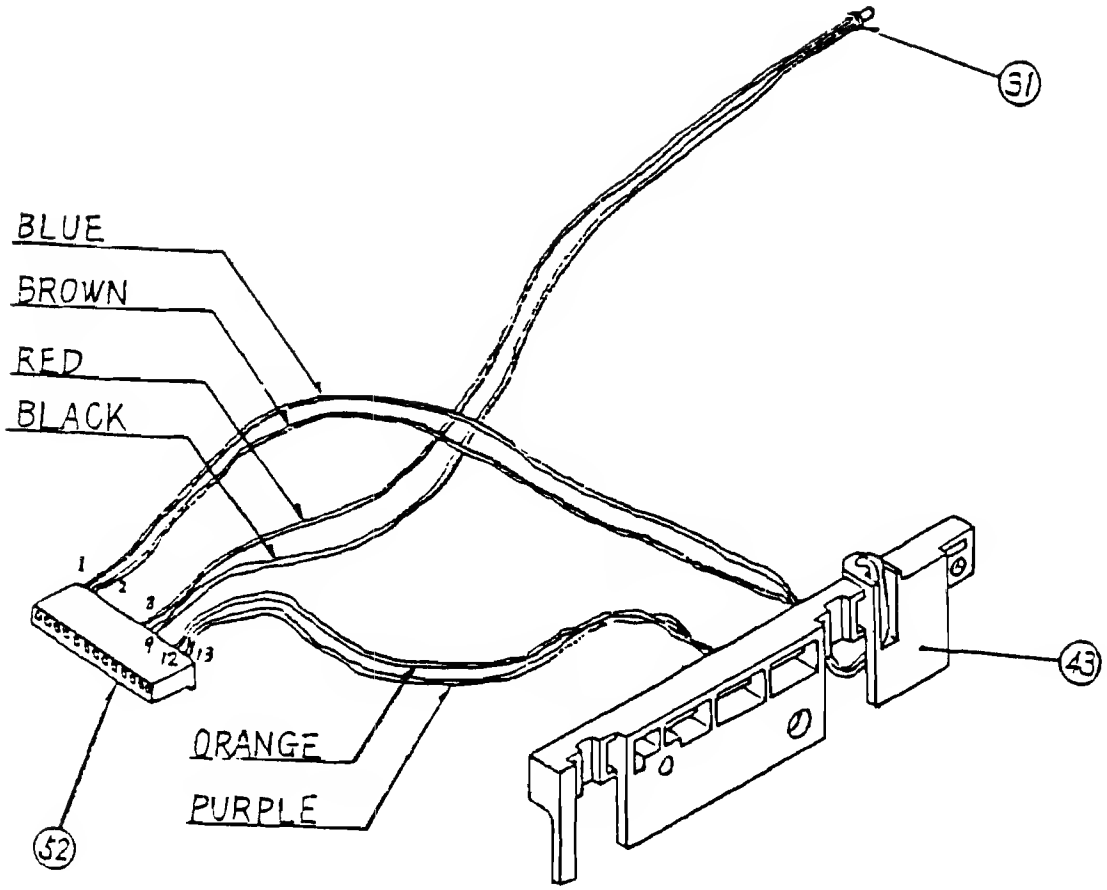
FIG 9

Part	Description	Part	Description
1	door assembly	13	hub support
2	collar	14	hub frame
3	clamp spring	15	binder screw
5	thrust washer	16	spring washer
6	collet assembly	17	arm support assembly
7	hub spring	18	binder screw
8	hub	19	pad plate assembly
9	hub shaft	27	hinge spring
10	door spring	60	collet
11	E-washer	61	collet bearing



2.3.8 FIG. 4, Diskette guide, LED assembly and connector housing.

Part	Description
31	LED assembly
43	diskette guide
52	connector housing



2.3.9 Secure the D.C. motor from the reverse side of the housing assembly with two screws.

2.3.10 Put the motor control PCB into hole 'A' and serure it with two screws.

2.3.11 Secure the stepping motor with two screws.

2.3.12 Secure the carraiage stopper with a screw.

2.3.13 Install the connector housing '52' into the hole 'B' and remove through hole 'C'.

2.3.14 Sercure the two diskette guides '21' and '43' with two screws each.

2.3.15 Install the LED holder in the front panel.

2.3.16 Insert the LED assembly into the LED holder ring.

2.3.17 Install the led into the LED holder, then push the LED holder ring onto the LED holder.

2.3.18 Attach the front panel with four flush screws.

2.3.19 Secure the eject plate with a screw.

2.3.20 Wind the metal band around the tension pulley.

2.3.21 Insert the guide shafts into the head assembly. Install the tension pullet as shown in figure 8

2.3.22 Secure the guide shaft keepers by two screws each.

2.3.23 Wind the metal band around the stepper pulley and secure it with a screw to the stepper motor pulley.

2.3.24 Hook the spring to the tension pulley and install unit in the slot in the housing assembly.

2.3.25 Hook the opposite end of the spring to the housing assembly.

2.3.26 Fasten cable ties to the cables.

2.3.27 Secure the cable clamp with a screw as shown in FIG 8.

2.3.28 Secure the arm support assembly with a screw to the hub support.

2.3.29 Insert the hub shaft into the hub, the hub spring, the collet assy, the thrust washer, the collar, the clamp spring and two collars.

2.3.30 Insert the hub shaft into the frame and the hub support and fasten it at the E-washer.

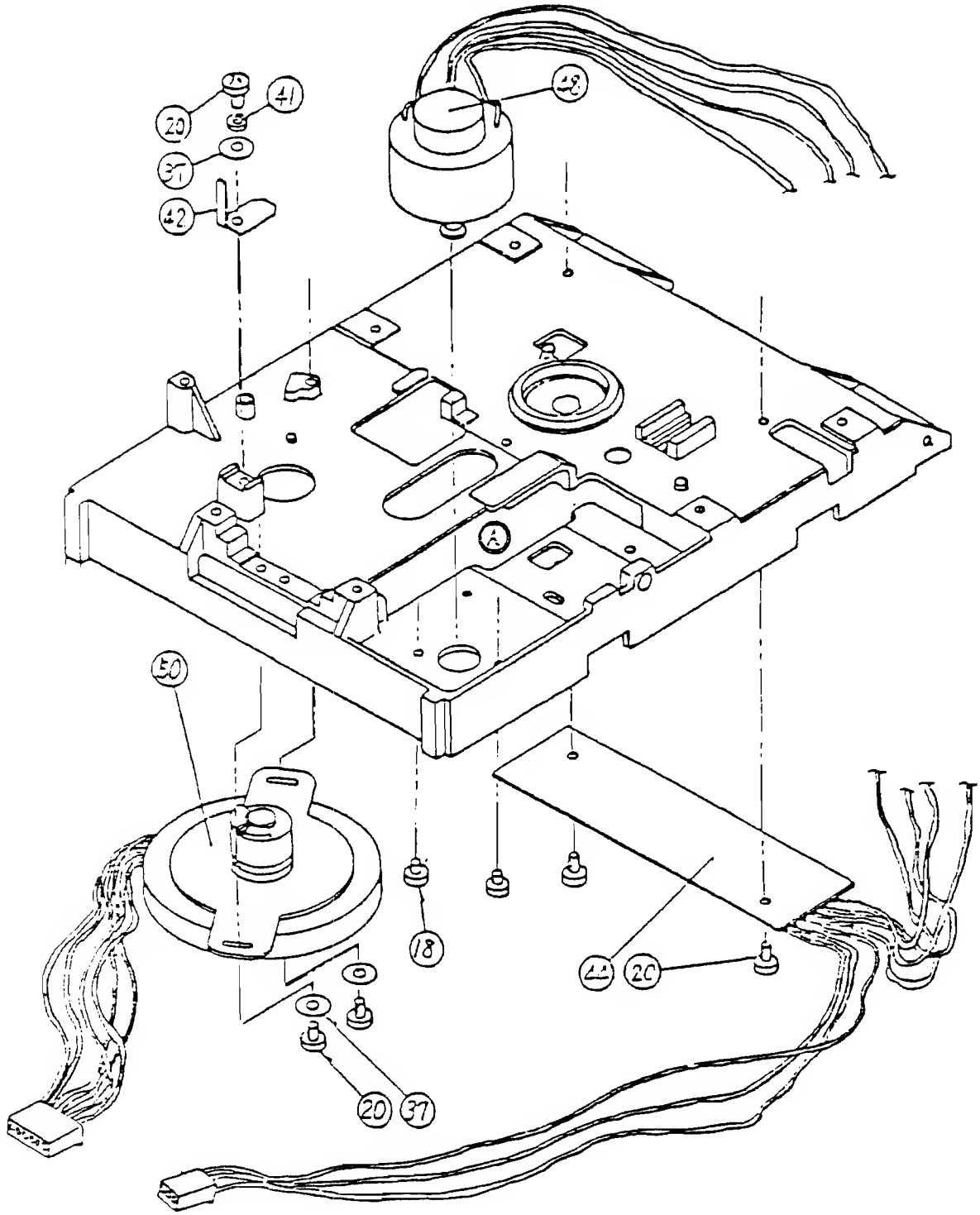
2.3.31 Set the door assembly and the door spring at the hub frame.

2.3.32 Secure the pad plate assembly with a srew to the frame at the location shown in FIG 9

2.3.33 Secure the two hinge springs with two srews each.

FIG. 5

Part	Description
18	binder screw
20	binder screw
37	washer
41	spring washer
42	carriage stopper
44	motor control PCB
50	stepping motor assembly

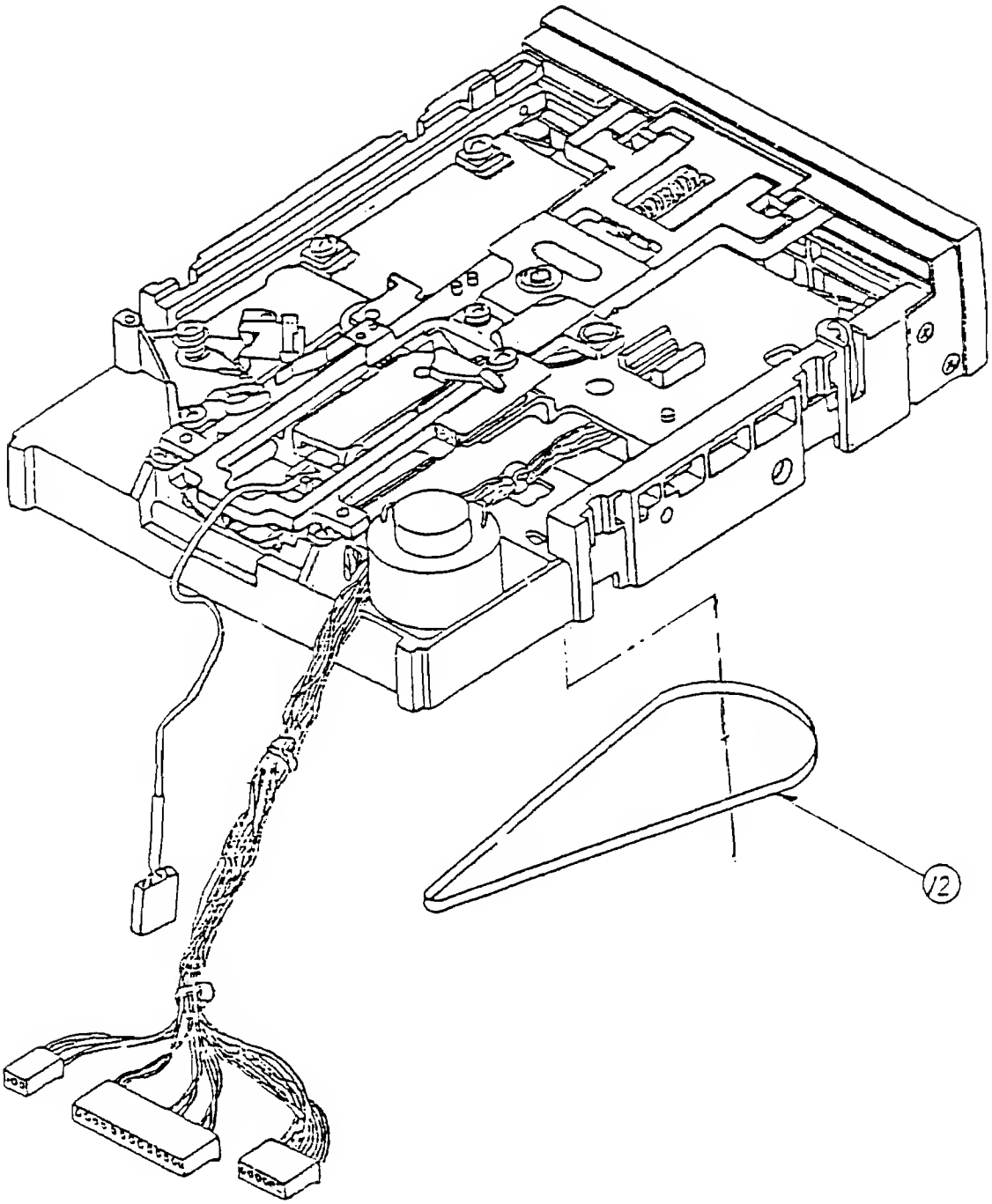


2.3.36 Place the belt over the D.C. motor pulley and partially on the spindle pulley.

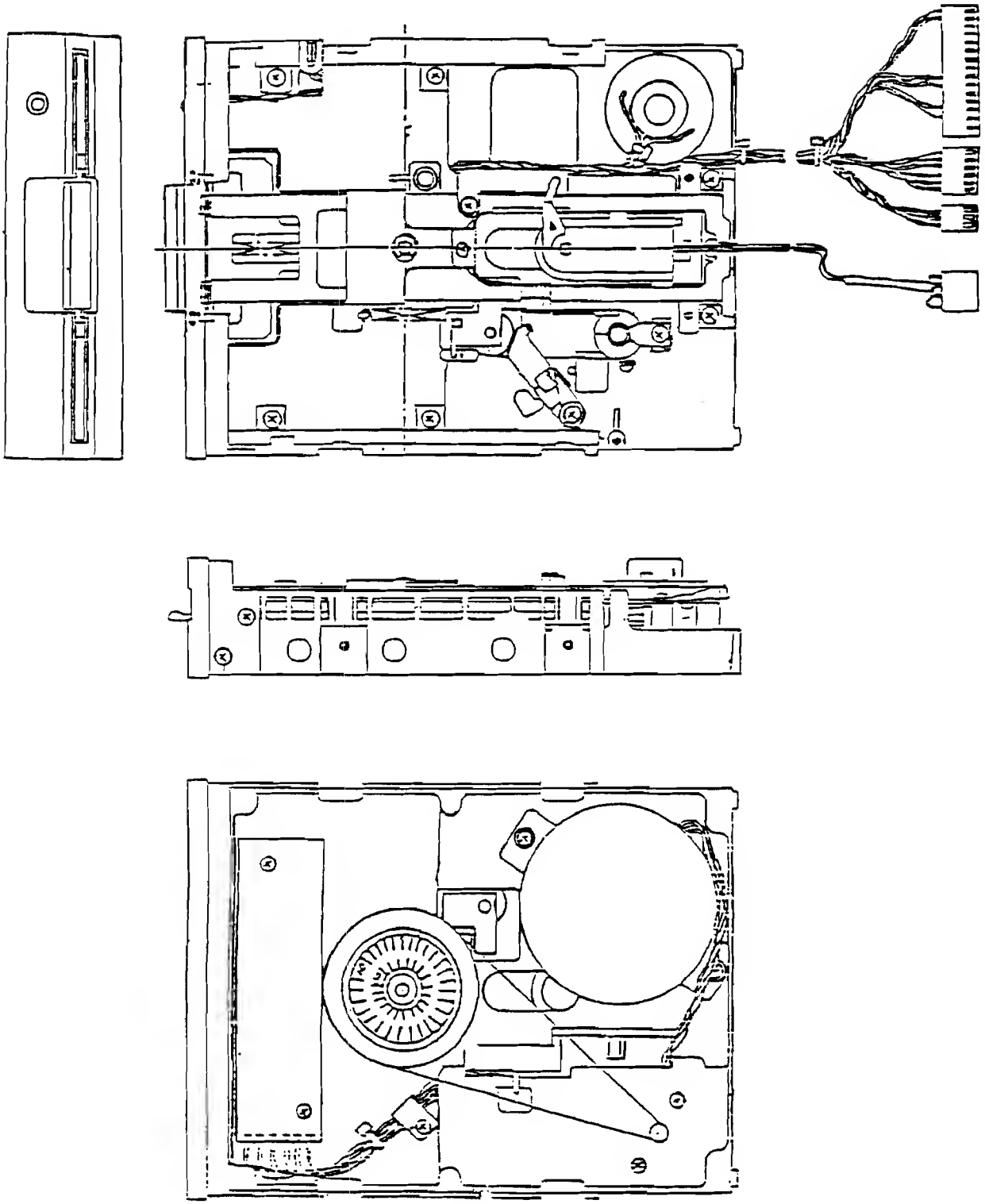
2.3.37 By turning the spindle pulley the rest of the belt will seat completely on the pulley.

2.3.38 FIG 10

Part	Description
12	drive belt



2.3.39 FIG 11; Completed Drive Mechanism



3.1 Description

Since the disk drive is placed under direct control of the interface and power supply, no special proceeedure is required for starting and operation.

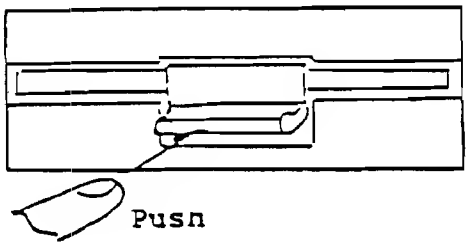
3.2 Operating proceedure

Make sure that the power supply and I/O connector are connected, then insert the disk in accordance with the following proceedure.

3.2.1 Inserting the media

a) Apply DC voltage to the drive.

b) Open the front door.



c) With the index hole and write protect notch being placed on the left side of the jacket, push the media in, when the media is fully inserted the loacking action can be felt.

d) Push the door downward and close the door so that it is locked firmly

3.2.2 Extracting the media

a) Open the front door. The media will pop out automatically to a position where you can extract it easily.

b) For protection of the recorded data, the media should always be stored in its envelope.

c) Close th door of the drive.

3.3 Media handling proceedure

Since the media has been sudjected to awrite operation i naturally contains imformation, adequate attention must be paid to its handling.

In order to extend the life of the media and eliminate the causes of errors, it is best to take the following steps:

a) When writing something on the jacket label of the media, **do not** use a ball point pen or pencil, use felt-tipped pens.

b) **Do not** hold the edges of the media with paper clips or the like.

c) **Do not** touch the media exposed in the slot of the jacket.

d) **Do not** attempt to clean the media.

e) **Do not** keep the media in the areas where there is a strong magnetic field.

f) The diskette should be kept in its jacket.

g) Special care should be exercised so that the media is kept free from liquid, dust, metal particles, etc.

h) Take care not to exceed the following environmental conditions:

Temperature	10 to 51°C
Relative humidity	8 to 80 %

3.4 Seek error

Few seek errors will be experienced due to the low stepping rate, less than 12 msec/track. In case of a seek error, however, recalibration of track position can be performed. This can be done by repeatedly stepping the head towards track 0 untill track 0 status is detected.

3.5 Write error

In order to check the quality of the data, perform a read-after-write operation. When data can not be read, rewrite that track and sector once again.

When data can not be read after four such operations track is defefective.

3.6 Read error

What happens quite often when performing a read operation is a soft error. A soft error is defined to be a read error which is recoverable by making ten or less read operations. However, in the event no recovery is made in ten operations, move one step from the track in the same direction as the previous step, then return one step. If this fails to read the data, this error is unrecoverable.

3.7 Description

Periodic maintenance is indispensable so that this type of peripherial equipment operates properly. It is particularly important to periodically clean the head and check the load pad. Repairs and adjustments should be made in accordance with the proceedures below.

3.8 Head Cleaning

Check for excessive dust or magnetic oxide on the load pad. With the door open (do not move upper arm greater that what is provided by opening the front door) clean head with lint free cotton cloth or 'Q-tip' in 91/ isopropyl alcohol. Wipe the head carefully to remove any dust and/or oxide.

3.9 Adjustment proceedure

In case of a malfuction or parts replacement, make the following adjustments. In order to maintain the interchangability of the media between drives it is desirable check each drive against a master alignment diskette.

3.9.1 Track adjustment (radial track)

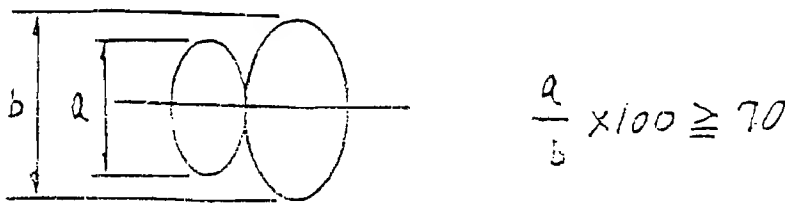
a) Connect I/O cable an restore the head to track 00.

b) Insert a 48tpi alignment diskette and close the door.

c) Connect two oscilloscope probes to pin 1 and pin 14 of UH6 (592), set oscilloscope to angbraic add at 50mV/cm and 200 msec/div.

d) Load the head and allow it to seek to track 16, check for cats eye wave form. When the cats eye lobe ratio is 70/ or less, loosen the stepping motor mounting screws, turn the stepping motor to obtain the lobe ratio of 90/ or less.

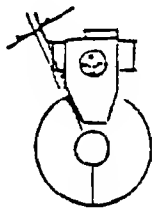
e) After allowing the head to track 34, return it to track 16 and recheck the cats eye. If the ratio is correct tighten the stepping motor screws.



Cats eye lobe ratio

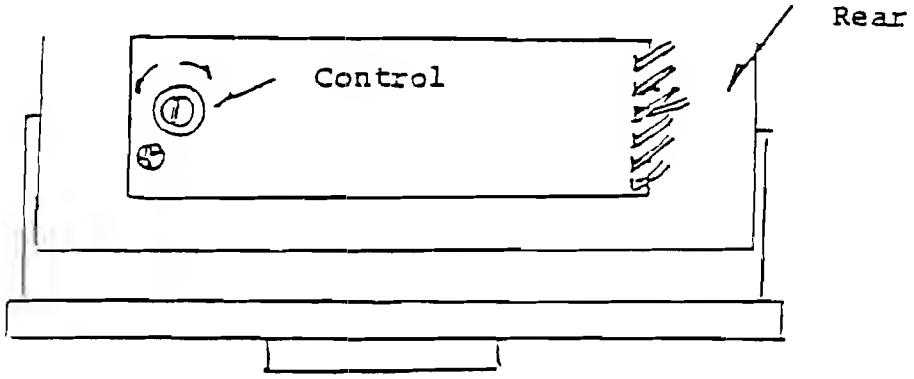
3.9.2 Track 00 adjustment

The drive is not provided with a track 00 sensor. To adjust, let the head over step in the track 00 direction and adjust the liniter postion to obtain a clearance less than 0.25mm (0.01inches).



3.9.3 Speed control

Turn the variable resistor on the motor control board untill the tachometer disk on the spindle pulley appears stationary when viewed with a fluorescent lamp.



PART NO.	DESCRIPTION
1540048-01	PCB ASSY. VIC-1541. FCC (UL) USED LOGIC ARRAY.

DWG NO. 1540048

TITLE: PCB ASSY. VIC-1541

REVISIONS

LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PRODUCTION RELEASE	12/12/82	T. MATSUMOTO
B		REVISED PER ECO 830085	2/8/83	
C		REVISED PER ECO 830125	3/15/83	

1. SHEET 7 & 8 OF 8 ARE B-SIZE ASSY DWG

NOTES-UNLESS OTHERWISE SPECIFIED:

commodore	DRAWN BY: T. Tokuda	DATE: 11/16/82	ENGR:		SIZE: B	SHEET 1 OF 8
	CHKD		APPR: T. MATSUMOTO	12/17/82 1/18/82		

QUANTITY REQD PER PART / DASH NO. 02	01	ITEM	SZ	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
	/	1	B	1540050	P C BOARD 238 x 155 x 1.6t			GLASS EPOXY. G-10
		2						
		3						
		4						
	RE F	5	C	1540049-01	SCHEMATIC DIAGRAM			USED LOGIC ARRAY. FCC (UL)
		7						
		8						
		9						
		10						
		11						
	/	12	B	901435-01	IC MPS 6502 CPU	UC4		
	2	13		901437-01	MPS 6522 VIA	UC2, UC3		
	/	14		901229-03	2364-197 ROM	UB4		$E000 ~ $FFFF
	/	15		325302-01	2364-130 ROM	UB3		$C000 ~ $DFFF
	/	16		325572-01	LOGIC ARRAY 40 PIN DIP	UC1		
	/	17		901521-01	74LS00 2-NAND	UC6		
	/	18		901521-17	74LS42 DEC.	UC7		
	/	19		901522-01	7417 BUFFER	UD2		
	/	20		901521-32	74LS86 2-EX-OR	UD3		
	2	21		901522-06	7406 INV. BUF.	UB1, UD1		
	/	22		901521-02	74LS04 INV.	UC5		
	/	23		901521-30	74LS14 SCH. INV.	UA1		
	/	24		901521-26	74LS193 4 BIT. COU.	UE6		
	/	25		901521-54	74LS197	UD5		
	S	26		901522-03	74177	UD5		SUBSTITUTE FOR ITEM 25.
	/	27		901510-01	9602	UD4		
	/	28		901523-04	LM311	UE4		
	2	29	B	901523-08	IC NE592	UF3, UF4		
	1	30	B	325502-03	IC TMM2016P RAM	UB2		
	S	31	B	325502-01	IC M58725P RAM	UB2		SUBSTITUTE FOR ITEM 30.
	S	32	B	901522-30	IC 7407	UD2		SUBSTITUTE FOR ITEM 19.
		33						
		34						
		35						
		36						
		37						

commodore

TITLE:	DRWN BY:	DATE	ENGR:	DATE	SIZE		REV	SHT
PCB ASSY. VIC-1541	T. Takuda	11/16/82	T.O.	12/17	B	1540048	C	2/8
	CHKD:		APPR: T.M	12/18				

QUANTITY REQD PER PART / DASH NO. 01	ITEM	B	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
2	38	B	902671	TRANSISTOR NPN 2SC945	Q2, Q7		
S	39		902693-01	2SC1815	Q2, Q7		SUBSTITUTE FOR ITEM 38.
4	40		902679	2SD467	Q8 - Q11		
S	41		902682	NPN 2SC2120	Q8 - Q11		SUBSTITUTE FOR ITEM 40.
1	42		902720	PNP 2SA673	Q1		
4	43		902717	2SA733	Q3 - Q6		
S	44	B	902744-01	TRANSISTOR PNP 2SA1015	Q3 - Q6		SUBSTITUTE FOR ITEM 43.
	45						
	46						
	47						
	48						
	49						
	50						
	51						
6	52	B	900750-02	DIODE, RECTIFIER IN4002	CR2,4,8-11		
8	53		900850-05	SIGNAL WG713C	CR6,7,12,14-18		
S	54		900850-01	SIGNAL IN4148	CR6,7,12,14-18		SUBSTITUTE FOR ITEM 53.
1	55		325505-01	ZENER 3.3V 500 mW ±5%	CR5		HZ3C-2
S	56		325505-02	3.3V 500 mW ±5%	CR5		HZ4A-1 SUB. FOR ITEM 55.
S	57		900948-06	3.3V 500 mW ±5%	CR5		IN5226B SUB. FOR ITEM 55.
1	58		325506-01	5.1V 500 mW ±5%	CR13		HZ5C-2
S	59		900948-11	ZENER 5.1V 500 mW ±5%	CR13		IN5231 SUB. FOR ITEM 58.
2	60	B	900756-01	DIODE BRIDGE 1.5A 50V	CR1, CR3		KBP-005
	61						
	62						
	63						
1	64	B	325566-01	CRYSTAL MODULE 16 MHz 50PPM	Y1		
S	65	B	325566-02	CRYSTAL MODULE 16 MHz 100PPM	Y1		SUBSTITUTE FOR ITEM 64.
	66						
	67						
	68						
1	69	B	325513-01	COIL, INDUCTOR 2.2 µH	L1		
2	70	B	325513-02	COIL, INDUCTOR 22 µH	L9, L10		
3	71	B	325513-03	COIL, INDUCTOR 100 µH	L8, L11, L12		
	72						
	73						
	74						

commodore

TITLE: PCB ASST. VIC-1541

DRWN BY: T Takuda DATE: 11/16/82

CHKD:

ENGR: JC DATE: 12/7

APPR: TH DATE: 12/7/82

SIZE: B 1540048 REV: C SHT: 3/8

QUANTITY REQD PER PART / DASH NO. 01	ITEM	☒	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
1	75	B	901528-04	VOLTAGE REGULATOR 12V, 1.5A	VR1		LM340-12 TO-3
1	76	B	901528-03	VOLTAGE REGULATOR 5V, 1.2A	VR2		LM340-5 TO-3
	77						
	78						
2	79	B	904914	INSULATION MYLAR TO-3			
S	80	B	325551-01	INSULATION SILICONE TO-3			SUBSTITUTE FOR ITEM 79.
	81						
	82						
2	83	B	903361	CONNECTOR, PIN 6P	P2, P3		
	84						
	85						
	86						
4	87	B	904150-06	SOCKET IC LOW PRO 40 PIN			
3	88	B	904150-03	SOCKET IC LOW PRO 24 PIN			
	89						
	90						
	91						
	92						
	93						
	94						
	95						
1	96	B	251065-04	HEADER ASSY. 2.5 PITCH 4 PIN	P8		MOLEX 5048-04AG
1	97	"	325562-06	" " " 6 PIN	P7		" 3022-06A
1	98	"	325562-15	" " " 15 PIN	P6		" 3022-15A
2	99	"	325562-03	" " 2.5 PITCH 3 PIN	P4, P5		" 3022-03A
1	100	B	903316-04	HEADER ASSY. 3.96 PITCH 4 PIN	P1		MOLEX 5271-04A
	101						
	102						
	103						
	104						
	105						
	106						
	107						
	108						
	109						
	110						
	111						

commodore

TITLE: PCB ASSY. VIC-1541

DRWN BY: T. Takuda DATE: 10/15/82

CHKD:

ENGR: YC DATE: 12-17

APPR: TM DATE: 12-18

SIZE: B | 1540048 | REV: C | SHT: 4/8

QUANTITY REQD PER PART / DASH NO. 01	ITEM	B	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
1	112	B	900301-04	CAPACITOR ELECT. 220μF/10V	C13		
1	113		900101-45	6800μF/25V	C17		
1	114		900101-32	4700μF/16V	C16		
2	115		900100-33	47μF/16V	C2, C5		
2	116		900100-32	ELECT. 1μF/25V	C1, C4		
1	117		900402-15	TANTALIUM 10μF/25V	C15		
1	118		900402-11	TANTALIUM 3.3μF/25V	C44		
1	119		900010-52	CERAMIC 150pF/50V	C31		±5%
2	120		-53	330pF/50V	C32, C36		±5%
3	121		-54	680pF/50V	C45, C33, C34		±5%
1	122		-25	1000pF/50V	C41		
24	123		-20	0.1μF/50V	C3, 6-10		14, 18, 19, 20, 22-30, 35, 40, 43, 47, 48
2	124		900010-14	CERAMIC 0.022μF/50V	C39, C42		
1	125		900100-40	ELECT. 100μF/16V	C46		
2	126		900402-17	TANTALIUM 0.47μF/25V	C37, C38		
1	127		-08	4.7μF/25V	C21		
1	128		900402-14	TANTALIUM 1μF/16V	C11		
1	129	B	900465-02	CAPACITOR CERAMIC 0.033μF/25V	C12		
	130						
	131						
	132						
	133						
1	134	B	901550-56	RESISTOR CARBON 1/4W ±5% 47Ω	R1		
2	135	B	901550-108	RESISTOR CARBON 1/4W ±5% 360Ω	R14, R24		
4	136		-89	150Ω	R17, 18, 45, 46		
4	137		-52	220Ω	R4, 16, 36, 55		
2	138		-14	330Ω	R3, R23		
6	139		-58	470Ω	R20, 22, 30, 37, 38, 41		
1	140		-38	510Ω	R27		
6	141		-31	680Ω	R31, 42, 49-50		
6	142		-01	1kΩ	R2, 5, 6, 7, 8, 43		
3	143		-53	2kΩ	R9, 10, 26		
6	144		-18	2.2kΩ	R11, 19, 21, 32-34		
1	145		-69	1.5kΩ	R40		
4	146		-12	22kΩ	R12, 35, 39, 52		
2	147	B	901550-07	RESISTOR CARBON 1/4W ±5% 100kΩ	R25, R44		
	148						

commodore

TITLE: PCB ASSY. VIC-1541

DRAWN BY: T. Takeuchi — DATE: 11/16/82

CHKD:

ENGR: [illegible] — DATE: 12/7

APPR: T. M — DATE: 12/7

SIZE: B

1540048

REV: C

SHT: 5/8

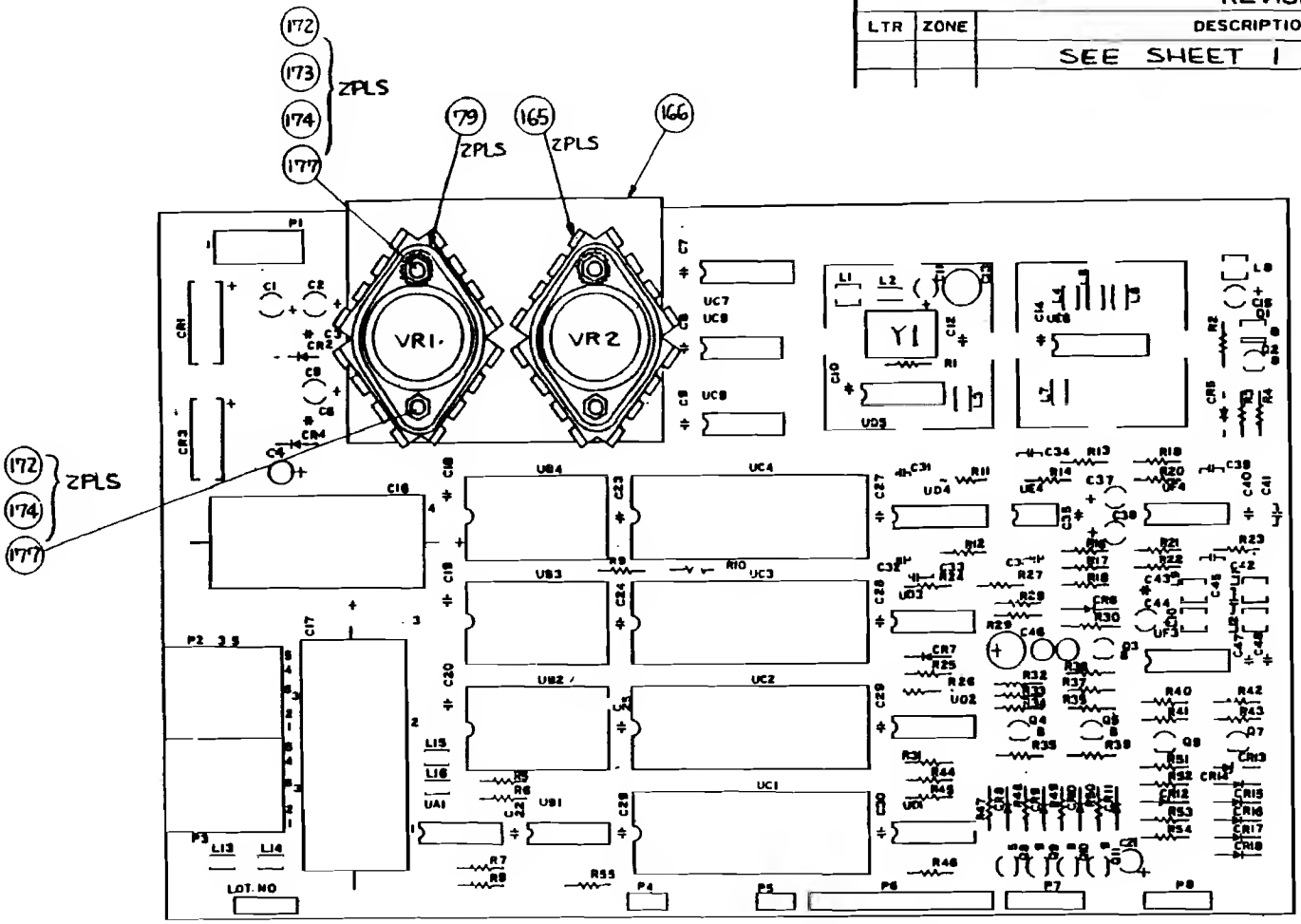
QUANTITY REQD PER PART / DASH NO. 01	ITEM	⊠	PART NUMBER	DESCRIPTION	REF DES	BEND	NOTES
1	149	B	901751-43	RESISTOR METAL OXIDE ¼W ±1% 91Ω	R51		
1	150		-18	100Ω	R28		
1	151		-44	150Ω	R29		
2	152	B	901751-45	RESISTOR METAL OXIDE ¼W ±1% 9.1kΩ	R53,R54		
	153						
	154						
	155						
	156						
	157						
10	158	B	325563-01	FERRITE BEAD	L2-7,13-16		
S	159	B	903025-01	FERRITE BEAD	L2-7,13-16		SUBSTITUTE FOR ITEM 158.
	160						
	161						
	162						
2	163	B	4022048	SHIELD BOX			
2	164	B	4022047	SHIELD CAP			
2	165	B	1540023	HEAT SINK TO-3			
1	166	B	1540011	HEAT SINK REGULATOR			
MR	167		904907-01	COMPOUND THER FOR HEAT SINK			
	168						
	169						
	170						
	171						
4	172	B	325541-05	SCREW PAN HEAD/EXT TOOTH WASHER M3-12			
2	173	B	905655-03	EXTERNAL TOOTH WASHER M3			
4	174	B	905960-03	NUT HEX. M3			
	175						
	176						
4	177	B	905477-02	TUBING VINYL 3.5 DIA X 5 MM			
	178						
	179						
	180						
	181						
	182						
	183						
	184						
	185						

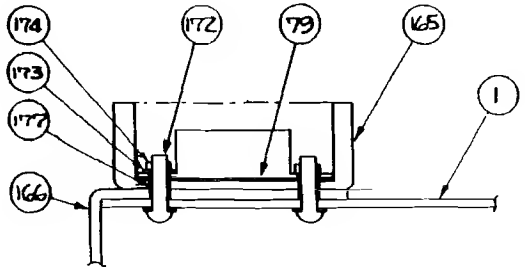
commodore

TITLE: PCB ASSY. VIC-1541

DRWN BY: T. Tokuda
CHKD:
DATE: 11/16/82
ENGR: YO
APPR: T.T
DATE: 11/17/82
SIZE: B
1540048
REV: C
SHT: 6/8

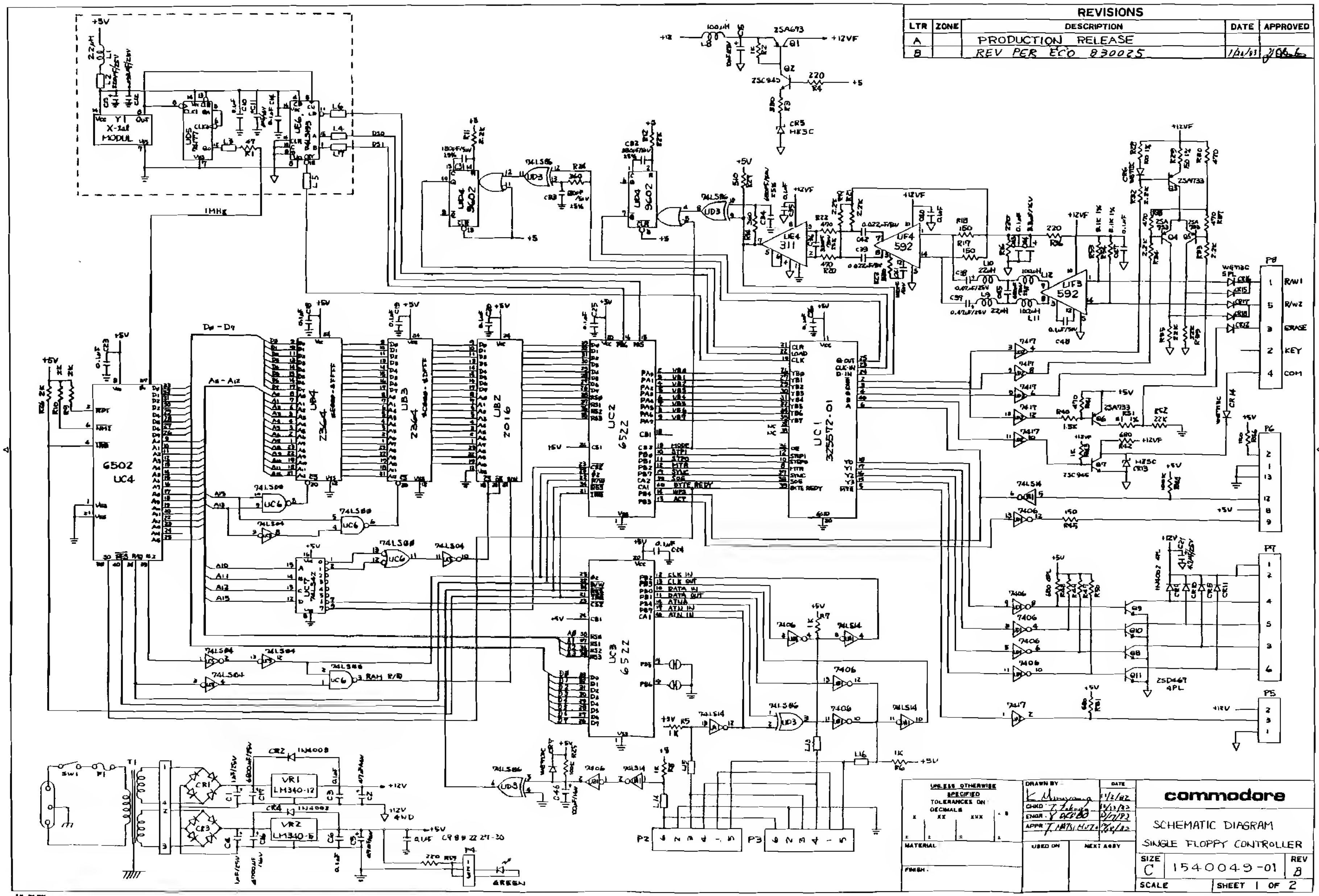
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		





UNLESS OTHERWISE SPECIFIED TOLERANCES ON: DECIMALS .X ± .XX ± .XXX ± ∠ ±	DRAWN BY: K. Maruyama	DATE	commodore
	CHKD: T. Fukuda	12/16/82	P.C.B ASSY VIC-1541
	ENGR:	12/17/82	
	APPR: T. Hirosaki	12/17/82	
MATERIAL:	USED ON: VIC-1541	NEXT ASSY	SIZE B / 1540048-01 / REV C
FINISH:			SCALE NONE / SHEET 7 OF 8

THIRD ANGLE SYSTEM. DIMENTION mm


REVISIONS
LTR | ZONE | DESCRIPTION | DATE | APPROVED
A | PRODUCTION RELEASE
B | REV PER ECO 830025 | 1/21/83
6502
UC4
UC1
325572-01
UC2
6522
UC3
6522
UB2
2016
UB3
2364
UB4
2364
UF3
592
UF4
592
UE4
311
UD4
9602
P8
R/W1
R/W2
ERASE
KEY
COM
P6
P7
P5
P2
P3
VR1
LM340-12
VR2
LM340-5
X-tal
MODUL
1MHz
D0 - D7
A0 - A12
RAM R/W
GREEN
commodore
SCHEMATIC DIAGRAM
SINGLE FLOPPY CONTROLLER
SIZE C
1540049-01
REV B
SCALE
SHEET 1 OF 2

PART NO.	DESCRIPTION
1540001 -01	PCB ASSY VIC-1540 (FCC) UL
1540001 -03	PCB ASSY VIC-1541 (FCC) UL

A	8/21/81	PRODUCTION RELEASE	T.T	D.T
B	5/24/82	ADDED SHEET 6 OF 7 (FOR FCC)	T.T	D.T
C	8/13/82	ADDED DASH -03 AND -04	T.T	D.T
D	11/20/82	ADDED ITEM 6.	T.T	T.T
E	3/3/83	REVISED PER ECO 830084	T.T	D.T

[2] THIS ROM CAN BE USED ON ONLY USA · CANADA AND JAPAN'S VERSION FOR SUBSTITUTE FOR ITEM 35.

1. SHEET 6&7 OF 7 ARE B-SIZE ASSY DWG.

NOTES.

c b m ENGINEERING OSAKA JAPAN	TITLE: PCB ASSY VIC-1540	DRAWN BY: Y. HAGIWARA	DATE: 7/1/81		DATE: / /	SIZE: B	1540001-	SHEET: 1 of 7
		CHKD.	8/26/81	APPR.	/ /			

QUANTITY REQD PER PART/DASH NO. 03	01	ITEM	VID	PART NUMBER	DESCRIPTION	REF. DES	REVD	NOTES
1	1	1	C	1540007	P.C. BOARD 315×155×1.6t			MTL: GLASS EPOXY G-10
		2						
		3						
REF	REF	4	C	1540008-01	SCHEMATIC DIAGRAM			
1		6	B	901229-03	IC 2364-197 ROM	UAB5		$E000 ~ $FFF
1	1	7	B	901435-01	IC MPS 6502 CPU	UCD5		
1	1	8	↓	325302-01	2364-130 ROM	UAB4		$ C000 ~ $DFFF
	1	9		325303-01	2364-131 ROM	UAB5		$ E000 ~ $FFFF
2	2	10		901437-01	MPS 6522 VIA	UAB1.UCD4		
4	4	11		901471-01	MPS 2114 RAM	UA2,3.UB2,3		
2	2	12		901521-01	74LS00 2-NAND	UB7.UF5		
1	1	13		901521-21	74LS02 2-NOR	UE5		
1	1	14		901521-02	74LS04 INV.	UB6		
1	1	15		901521-24	74LS 10 3-NAND	UF3		
1	1	16		901521-30	74LS14 SCH. INV.	UC1		
1	1	17		901521-17	74LS42 DEC.	UB8		
2	2	18		901521-06	74LS 74 D-FF	UE4, UF6		
1	1	19		901521-32	74LS 86 2-Ex-OR	UG2		
1	1	20		901521-15	74LS 133 13-NAND	UC2		
1	1	21		901521-18	74LS 139 Dem. P	UE2		
1	1	22		901521-28	74LS 164 8 Bit Shift Reg	UD2		
1	1	23		901521-12	74LS 165 8 Bit Shift Reg	UD3		
1	1	24		901521-40	74LS 191 4 Bit Count.	UE3		
2	2	25		901521-26	74LS 193 4 Bit Count.	UE7, UF4		
1	1	26		901521-45	74LS 245 Bus. Tranceiver	UC3		
1	1	27		901522-32	7402	UC7		
2	2	28		901522-06	7406 INV. OC.	UD1, UF2		
1	1	29		901522-03	74177	UC6		
1	1	30		901510-01	9602	UG3		
1	1	31	↓	901523-04	LM311	UH4		
2	2	32	B	901523-08	NE592	UH5. UH7		
1	1	33	B	901522-01	7417	UG4		
S	S	34	B	901521-54	74LS197	UC6		SUBSTITUTION FOR ITEM 29
S		35	B	901229-02	2364-186 ROM	UAB5		$E000 ~ $FFFF SUB. FOR ITEM 6.
S		36	B	901229-01	IC 2364-173 ROM	UAB5		$E000 ~ $FFFF SUB. FOR ITEM 6. 2

c b m ENGINEERING OSAKA JAPAN	TITLE: PCB ASSY VIC-1540	DRAWN BY:	DATE 1/1		DATE 1/1	SIZE B	1540001-	SHEET 2 of 7
		CHKD: T. Takeda	DATE 8/21/81	APPR:				

QUANTITY REQD PER PART/DASH NO. -03	-01	ITEM		PART NUMBER	DESCRIPTION	REF. DES	BEND	NOTES
2	2	37	B	902671	TRANSISTOR NPN 2SC945	Q2, Q3		
S	S	38		902693-01	NPN 2SC1815	Q2, Q3		SUBSTITUTION FOR ITEM 37
4	4	39		902679	NPN 2SD467	Q4-Q7		
S	S	40		902682	NPN 2SC2120	Q4-Q7		SUSTITUTION FOR ITEM 39
1	1	41		902720	PNP 2SA673	Q1		
4	4	42		902717	PNP 2SA733	Q8-Q11		
S	S	43	B	902744-01	TRANSISTOR PNP 2SA1015	Q8-Q11		SUBSTITUTION FOR ITEM 42
S	S	44	B	901522-30	IC 7407	UG4		SUBSTITUTION FOR ITEM 33
		45						
6	6	46	B	900750-02	DIODE, SIGNAL 1N4002	CR2,4,13-16		
8	8	47		900850-05	SIGNAL WG713C	CR6-11,17,18		
S	S	48		900850-01	SIGNAL 1N4148	CR6-11,17,18		SUBSTITUTION FOR ITEM 47
1	1	49		325505-01	ZENER 3.3V 500mW ±5%	CR5		HZ3C-2
S	S	50		325505-02	3.3V 500mW ±5%	CR5		HZ4A-1 SUB. FOR ITEM 49
S	S	51		900948-06	3.3V 500mW ±5%	CR5		1N5226B SUB. FOR ITEM 49
1	1	52		325506-01	5.1V 500mW ±5%	CR12		HZ5C-2
S	S	53		900948-11	ZENER 5.1V 500mW ±5%	CR12		1N5231 SUB. FOR ITEM 52
1	1	54		900756-01	BRIDGE 1.5A 50V	CR1		KBP-005
1	1	55	B	900755-02	DIODE, BRIDGE 4A 50V	CR3		KBL-02
		56						
1	1	57	B	900556-02	CRYSTAL 16MHz	Y1		
		58						
1	1	59	B	325513-01	COIL, INDUCTOR 2.2µH	L1		
2	2	60	B	325513-02	COIL, INDUCTOR 22µH	L8, L11		
3	3	61	B	325513-03	COIL, INDUCTOR 100µH	L7, L9, L10		
		62						
1	1	63	B	901528-04	VOLTAGE REGULATOR 12V 1.5A	VR1		LM340-12
1	1	64	B	901528-01	VOLTAGE REGULATOR 5V 3A	VR2		LM323
2	2	65	B	904914	INSULATION MYLAR TO-3			ATTACHED WITH VOLT REGULATOR
S	S	66	B	325551-01	INSULATION SILICONE TO-3			SUBSTITUTION FOR ITEM 65.
		67						
2	2	68	B	903361	CONNECTOR, DIN 6PIN	P3, P4		HOSHIDENKI TCS4460-01-101
		69						
3	3	70	B	904150-06	SOCKET IC LOW PRO. 40PIN			
2	2	71	B	904153-03	SOCKET IC LOW PRO. 24PIN			
		72						

cbm ENGINEERING
OSAKA JAPAN

TITLE: PCB ASSY VIC-1540

DRAWN BY: DATE / /
CHKD. A. Takai 8/12/81 APPR:

DATE / / / / SIZE B 1540001- SHEET 3 OF 7

QUANTITY REQD PER PART/DASH NO. -04	-03	-02	-01	ITEM		PART NUMBER	DESCRIPTION	REF. DES	NOTES
	1		1	73	B	325514-04	HEADER ASSY 2.5 PICH R-ANG. 4PIN	P2	MOLEX 5049-04AG
	1		1	74		325515-06	6PIN	P7	3094-06A
	1		1	75		325515-15	15PIN	P6	3094-15A
	2		2	76	B	325515-03	2.5 PICH R-ANG. 3PIN	P5, P8	3094-03A
	1		1	77	B	903316-04	HEADER ASSY 3.96 PICH 4PIN	P1	MOLEX 5271-04A
				78					
	1		1	79	B	900100-03	CAP. ELECTROLYTIC 220µF/25V	C65	
	1		1	80	B	900101-44	CAP. ELECTROLYTIC 10000µF 16V	C52	AXIAL LEAD φ22×52
	1		1	81		900101-45	6800µF 25V	C51	AXIAL LEAD φ22×52
	2		2	82		900100-33	47µF 16V	C2, C5	
	2		2	83		900100-32	ELECTROLYTIC 1µF 25V	C1, C4	
	1		1	84		900402-15	TANTALIUM 10µF 25V	C12	
	1		1	85		900402-11	TANTALIUM 3.3µF 25V	C23	
	1		1	86		900010-51	CERAMIC 68PF 50V	C10	
	1		1	87		900010-52	150PF 50V	C33	± 5%
	2		2	88		900010-53	330PF 50V	C28, C49	± 5%
	3		3	89		900010-54	680PF 50V	C16, C27, C50	± 5%
	1		1	90		900010-25	1000PF 50V	C26	
	40		40	91		900010-20	0.1µF/50V	C3,6-9,11,13,14,17-22	25,29-32,34-48,53-55,57,60,61
	2		2	92		900010-14	CERAMIC 0.022µF 50V	C58, C59	
	1		1	93		900100-40	ELECTROLYTIC 100µF 16V	C56	
	2		2	94	B	900402-17	CAP. TANTALIUM 0.47µF 16V	C15, C24	± 20%
	1		1	95	B	900402-08	CAP. TANTALIUM 4.7µF/25V	C62	
	1		1	96	B	900402-14	CAP. TANTALIUM 1µF/10V	C63	
	1		1	97	B	900465-02	CAP. CERAMIC 0.033µF/25V	C64	
	2		2	98	B	901550-108	RESISTOR, CARBON 1/4W 5% 360Ω	R25, R30	
	1		1	99	B	901550-56	RESISTOR, CARBON 1/4W 5% 47Ω	R3	
	4		4	100	B	901550-89	RESISTOR, CARBON 1/4W 5% 150Ω	R18,19,35,36	
	4		4	101		901550-52	220Ω	R4,16,17,45	
	5		5	102		901550-14	330Ω	R1,2,5,20,37	
	6		6	103		901550-58	470Ω	R27,28,43,50,55,57	
	1		1	104		901550-30	510Ω	R24	
	5		5	105		901550-31	680Ω	R9, R39-R42	
	8		8	106		901550-01	1 KΩ	R6,11,31-34,44,57	
	4		4	107		901550-53	2 KΩ	R21-R23, R38	
	6		6	108	B	901550-18	RESISTOR, CARBON 1/4W 5% 2.2KΩ	R14,15,26,51,52,66	

c b m ENGINEERING
OSAKA JAPAN

TITLE: PCB ASSY VIC-1540

DRAWN BY: DATE / /

CHKD: A. Takano 8/21/81 APPR:

DATE / / / / SIZE B 1540001- SHEET 4 OF 7

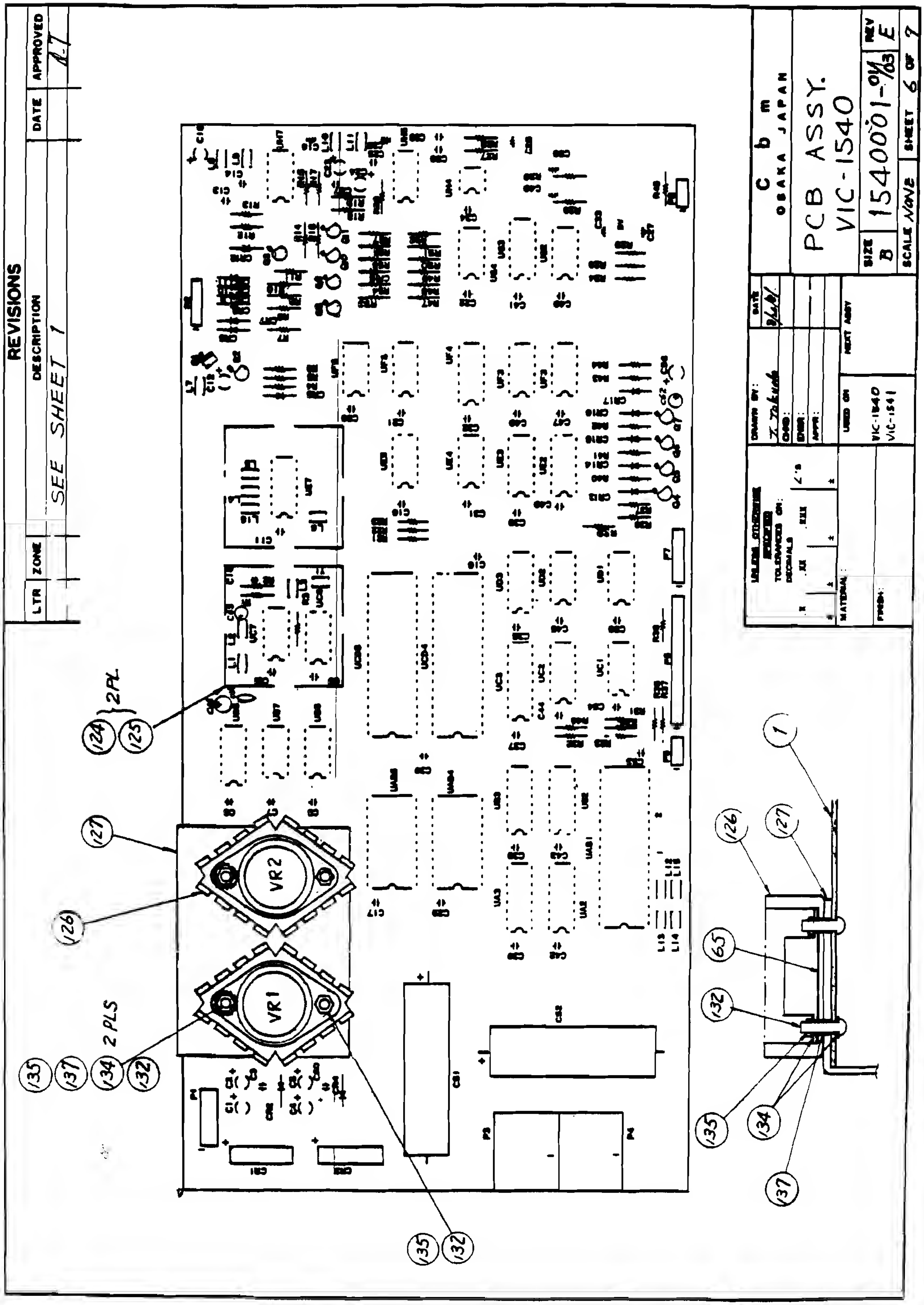
QUANTITY REQD PER PART/DASH NO. -04	-03	-02	-01	ITEM	S.D.	PART NUMBER	DESCRIPTION	REF. DES	BEND	NOTES
	1		1	109	B	901550-69	RESISTOR, CARBON 1/4W 5% 1.5KΩ	R48		
	4		4	110	B	901550-12	22KΩ	R7,10,29,53		
	2		2	111	B	901550-07	RESISTOR, CARBON 1/4W 5% 100KΩ	R43, R46		
				112						
	1		1	113	B	901751-43	RESISTOR, METAL OXIDE 1/4W 1% 91Ω	R8		
	1		1	114	B	901751-18	RESISTOR, METAL OXIDE 1/4W 1% 100Ω	R49		
	1		1	115	B	901751-44	RESISTOR, METAL OXIDE 1/4W 1% 150Ω	R54		
	2		2	116	B	901751-45	RESISTOR, METAL OXIDE 1/4W 1% 9.1 KΩ	R12, R13		
				117						
				118						
				119						
				120						
	10		10	121	B	903025-01	FERRITE BEAD	L2-L6, L12-L16		
				122						
				123						
	2		2	124	B	4022048	SHIELD BOX			
	2		2	125	B	4022047	SHIELD CAP			
	2		2	126	B	1540023	HEAT SINK TO-3			
	1		1	127	B	1540011	HEAT SINK REGULATOR			
	A/K		A/K	128		904907-01	COMPOUND THER FOR HEAT SINK			CONJUNCTION WITH ITEM 65
				129						
				130						
				131						
	4		4	132	B	906800-02	SCREW PAN HEAD M3x10			
	4		4	134	B	905655-03	EXTERNAL TOOTH WASHER M3			
	4		4	135	B	905960-03	NUT HEX. M3			
				136						
	4		4	137	B	905477-02	TUBE VINYL φ3.5 × L 5mm			
				138						
				139						
				140						
				141						
				142						
				143						
				144						
				145						

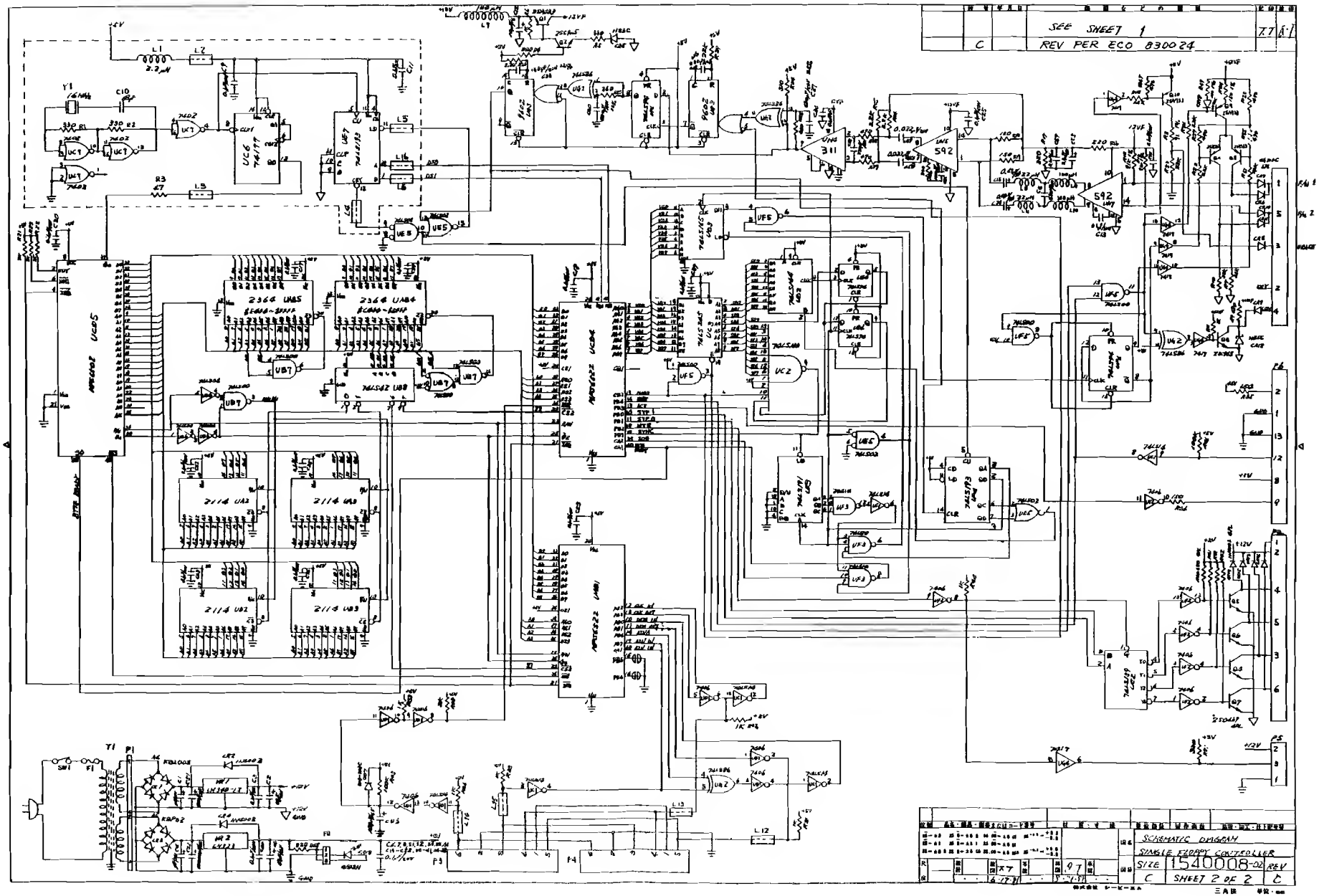
cbm ENGINEERING
OSAKA JAPAN

TITLE: PCB ASSY VIC-1540

DRAWN BY: DATE / /
CHKD: [illegible] 8/21/81
APPR: DATE / / / /

SIZE: B | 1540001- | SHEET 5 of 7


REVISIONS
LTR
ZONE
DESCRIPTION
DATE
APPROVED
SEE SHEET 1
2PL
2 PLS
VR1
VR2
C b m
OSAKA JAPAN
PCB ASSY.
VIC-1540
SIZE
B
1540001-01/03
REV
E
SCALE NONE
SHEET 6 OF 7
DRAWN BY:
CHKD:
ENGR:
APPR:
DATE
NEXT ASSY
USED ON
VIC-1540
VIC-1541
MATERIAL:
FINISH:


SEE SHEET 1
C
REV PER ECO 830024
SCHEMATIC DIAGRAM
SINGLE FLOPPY CONTROLLER
SIZE
1540008-02
REV
C
SHEET 2 OF 2
C

PART NO.	DESCRIPTION
1540002-01	POWER SUPPLY ASSY VIC-1540 UL
-06	VIC-1541 UL

A	9/26/81	PRODUCTION RELEASE		
B		CHANGED FILTER POWER CONNECTOR FOR CSA (ITEM 24 WAS ITEM 23)	7.T	
C	5/24/82	CHANGED FILTER POWER CONNECTOR FOR FCC (ITEM 25 WAS ITEM 23)	7.T	
D	6/22/82	CHANGED ACCESSORY OF TRANSFORMER	7.T	
E	8/13/82	CHANGED SCREW TO H3-6 FROM H3-8. ADDED DASH 06 THRU 10 AND ITEM 21.	7.T	
F	12/7/82	ADDED ITEM 8, 9 AND 63. ADDED SHEET 5 OF 5.	7.T	
G	2/8/83	REVISED PER ECO 830060		
H	3/5/83	REVISED PER ECO 830101		

4. NO CHANGE QTY FOR ITEM 54 IF USED ITEM 6 OR 7.

3. USE ONLY WHEN USED ITEM 8 OR 9.

2. IF ITEM 8 OR 9 ARE USED THEN QTY FOR ITEM 54 WILL CHANGE FROM 7 TO 9 PCS AND USED WITH ITEM 63.

1. SHEET 4 & 5 OF 5 ARE D-SIZE ASSY DWG.

NOTES.

cbm ENGINEERING OSAKA JAPAN	TITLE: POWER SUPPLY ASSY VIC-1540	DRAWN BY: Y. INAGAKI DATE 7/1/81 CHKD	APPR:	DATE / /	SIZE B	1540002-	SHEET 1 OF 5

QUANTITY REQD PER PART/DASH NO. 10 09 08 07 06 05 04 03 02 01	ITEM	S/D	PART NUMBER	DESCRIPTION	REF. DES	BEND	NOTES
S / 1	1	D	1540012	POWER . CHASSIS			SUBSTITUTE FOR ITEM 2 . SEE NOTE 2
/ 1	2	D	251153	POWER CHASSIS			SEE NOTE 3
	3						
1	4	B/D	1540001 -01	PCB ASSY (FCC) UL			
	5	B/D	1540001 -02	PCB ASSY			
S	6	B/D	1540001 -03	PCB ASSY (FCC) UL			SUBSTITUTE FOR ITEM 8
	7	B/D	1540001 -04	PCB ASSY			SUBSTITUTE FOR ITEM 9
1	8	B	1540048 -01	PCB ASSY (FCC) UL			USED LOGIC ARRAY
	9	B	1540048 -02	PCB ASSY			USED LOGIC ARRAY
	10						
	11						
S / S	12	B	325519 -01	FLOPPY DISK (BLACK)			SUBSTITUTE FOR ITEM 13
1 / 1	13	B	325519 -02	FLOPPY DISK (BROWN)			
1 / 1	14	B	903614 -01	FUSE HOLDER FH 032			
	15						
	16	B	903615 -01	FUSE HOLDER FH 033			
	17						
	18						
1 / 1	19	B	904509 -01	SWITCH . ROCKER	S W 1		
	20						
S / S	21	B	325552 -01	FILTER POWER CONNECTOR			SUBSTITUTE FOR ITEM 23 (TOKIN)
	22						SUBSTITUTE FOR ITEM 23
	23						
	24						SUBSTITUTE FOR ITEM 23 (HAVAI PA-126)
1 / 1	25	B	903467 -03	FILTER POWER CONNECTOR			
	26						5.2$^{\phi}$ x 20 mm
1 / 1	27	B	903555 -20	FUSE. SLO BLO 250V 1.0A			6.3$^{\phi}$ x 30 mm
	28						
1 / 1	29	C	1540009 -01	POWER TRANSFORMER UL JPN 120/100V	T 1		
S / S	30	C	1540009 -02	POWER TRANSFORMER CSA	T 1		
	31						
	32						
4 / 4	33	B	325548 -04	SCREW PAN HEAD WITH SPRING WASHER M5-10			TO BE ATTACHED WITH X-FORMER
	34						
	35						
	36						

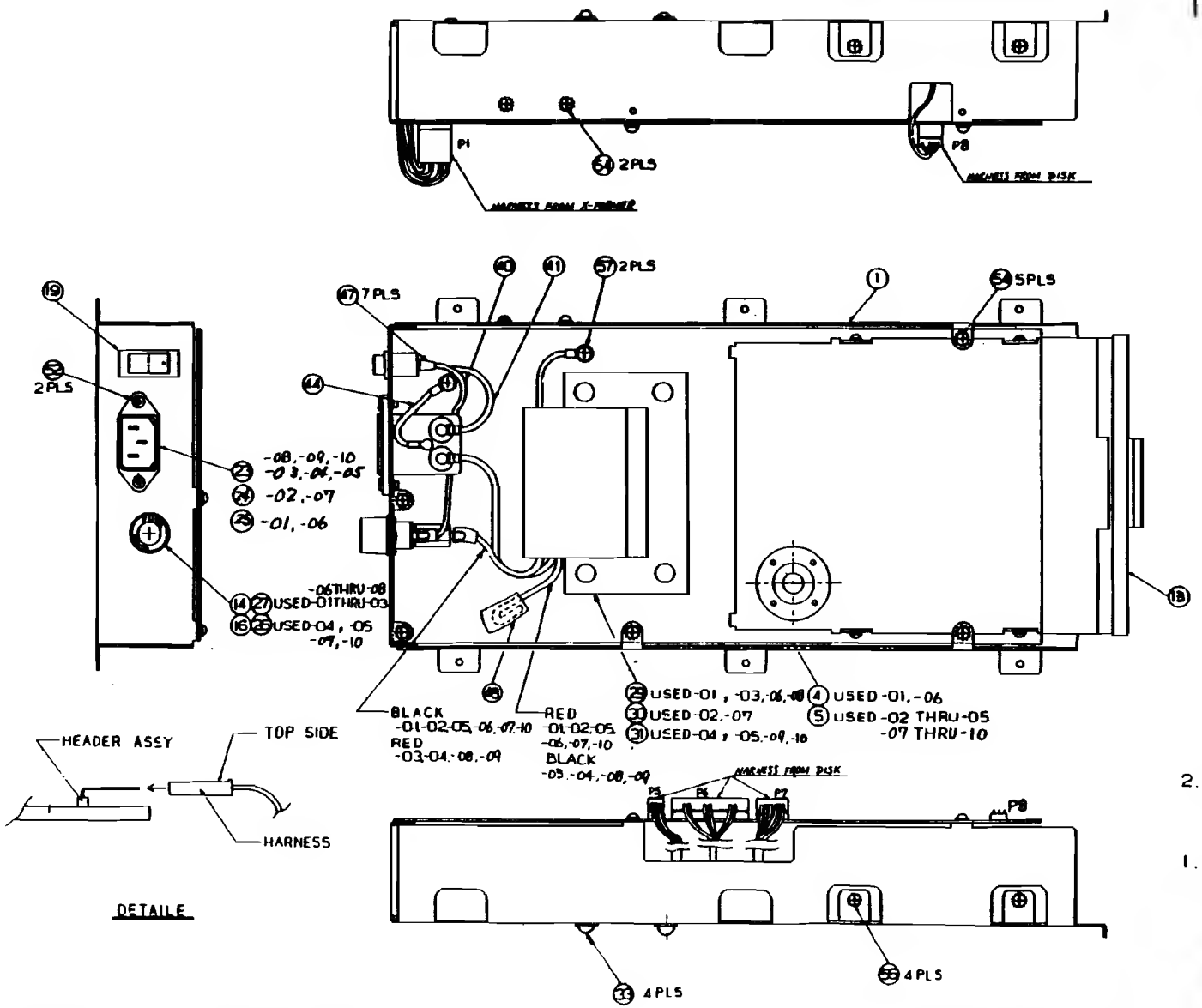
c b m ENGINEERING OSAKA JAPAN	TITLE: POWER SUPPLY ASSY V.C-150	DRAWN BY:	DATE		DATE	SIZE	SHEET
		CHKD:		APPR:	/ /	B	2 OF 5

15-10002-

QUANTITY REQD PER PART/DASH NO. 06	QUANTITY REQD PER PART/DASH NO. 01	ITEM	S/D	PART NUMBER	DESCRIPTION	REF. DES	END	NOTES
		37						
		38						
		39						
1	1	40	B	200017 -03	LEAD WIRE (BLACK)			1015 AWG-18 L 150 MM
1	1	41	B	200017 -04	LEAD WIRE (BLACK)			1015 AWG-18 L 80 MM
		42						
		43						
1	1	44	B	1540010	GROUND CABLE ASSY			
		45						
		46						
7	7	47	B	905476 -02	TUBING SHRINCABLE			ϕ5 x 20
1	1	48	B	905476 -04	TUBING SHRINCABLE			ϕ4 x 40
		49						
		50						
		51						
2	2	52	B	906803-02	SCREW FLAT HEAD M3X8			FILTER CONNECTOR (2)
		53						
7	7	54	B	325541-02	SCREW PAN HEAD M3X6 W/EXT	TOOTH WASHER		PCB (5), SEE NOTE 2
		55						
4	4	56	B	906610-03	SCREW PAN HEAD NO.6-32 UNC L10mm			FLOPPY DISK (4)
2	2	57	B	325542-02	SCREW PAN HEAD M4X6 W/EXT	TOOTH WASHER		GROUND (2)
		58						
		59						
		60						
		61						
		62						
2		63	B	1540051	METAL, L-ANGLE			SEE NOTE 2
		64						
		65						
		66						
		67						
		68						
		69						
		70						
		71						
		72						

cbm ENGINEERING OSAKA JAPAN	TITLE: POWER SUPPLY ASSY VIC-1540	DRAWN BY: Y. IMAGAWA	DATE 7/1/81		DATE 7/1/81 / /	SIZE B	1540002-	SHEET 3 OF 5
		CHKD. E. Takase	8/21/81	APPR:				

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1	8/21/86	C.T



2. ALL LEADS WILL HAVE A MINIMUM OF ONE WRAP AROUND TERMINALS PRIOR TO SOLDERING.

1. ALL OF HARNESS EXCEPT P1 SHOULD BE CONNECTED TO EACH HEADER ASSY (SEE DETAIL).

	commodore	
	POWER SPLLY ASSY	
	D 1540002	0